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TEXAS AGRICULTURAL EXPERIMENT STATION
AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS
W. B. BIZZELL, President

BULLETIN NO. 274 FEBRUARY, 1921

DIVISION OF AGRONOMY

COTTON VARIETY EXPERIMENTS

SUBSTATION NO. 3,
ANGLETON, TEXAS

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†As of February 1, 1921.
*In cooperation with the School of Veterinary Medicine, A. & M. College of Texas.
**In cooperation with the United States Department of Agriculture.

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BULLETIN No. 274. FEBRUARY, 1921.

COTTON VARIETY EXPERIMENTS

SUBSTATION NO. 3, ANGLETON, TEXAS.

BY

E. B. REYNOLDS, AGRONOMIST.*

Substation No. 3, of the Texas Agricultural Experiment Station, is located in the Texas Gulf Coastal Plains about forty-four miles south of Houston and thirty-eight miles southwest of Galveston. The nearest point on the Gulf of Mexico is about eighteen miles distant. The experiment fields of the substation farm are approximately 22.5 feet above sea level.

The topography is prevailingly flat with poor drainage. The soil is a black clay with a gray clay subsoil classed by the Bureau of Soils as Victoria clay. Chemical analyses show it to be low in phosphorus, and fairly well stocked with potash and lime.

The rainfall is quite frequently too heavy for maximum crop production, but in 1917 and 1918 the rainfall was low. The rainfall by months from 1914 to 1920, inclusive, is given in an appendix at the back of this bulletin.

This bulletin gives briefly the results of experiments with different varieties of cotton conducted at Substation No. 3, from 1917-1920, inclusive. No attempt is made to go into details of these experiments. The bulletin makes available certain data on the varieties of cotton which have not heretofore been available to the general public.

Variety tests of cotton have been conducted since 1913, but yields have not been secured every year, for one or more reasons. For instance, in 1915 the test was destroyed by a tropical storm in August; while in 1914 it was a failure on account of drouth in May followed by heavy rains.

Previous to 1917 the cotton-variety tests were largely preliminary in nature, in which many of the undesirable varieties were discontinued, and other varieties added from time to time as the results warranted.

All of the varieties that have been tested at Substation No. 3 are not included in this bulletin. It does include, however, several of the best-yielding varieties which have appeared each of the four years 1917-1920, inclusive, and others which have made a creditable showing.

METHOD OF CONDUCTING TESTS

As a rule, the cotton in the variety tests was planted in rows three feet apart. The plants were thinned out so as to leave only one plant

*Superintendent of Substation No. 3, from August, 1918, to November, 1920. Credit is due Mr. N. E. Winters, Superintendent, from 1913 to 1918; also to the Division of Plant Breeding for participating in the work in 1919 and 1920.

every foot, but in 1918 the plants were left 18 inches apart in the row. Ordinary clean cultivation was practiced. Fertilizers were not used in these tests except in 1917 when acid phosphate was applied.

The following bulletins of the Texas Agricultural Experiment Station report part of the work conducted at Substation No. 3:

Bulletin No. 172—Sudan Grass.

Bulletin No. 195—Japanese Sugar Cane as a Forage Crop.

Bulletin No. 197—Progress Report at Substation No. 3, Angleton, Texas, 1909-1914.

Bulletin No. 229—Experiments at Substation No. 3, 1909-1916.

Bulletin No. 230—Spacing of Rows in Corn and Its Effect Upon Grain Yield. (Exhausted.)

Bulletin No. 266—The Staple of Texas Cotton.

EXPERIMENT DATA

The results of the cotton variety test for each of the four years, 1917, 1918, 1919, and 1920, are given in separate tables to afford a better idea of the comparative value of each of the more profitable varieties. For 1917 the varieties are arranged in order of lint yield, as the lint was not stapled and graded. In 1918, 1919, and 1920 the varieties are listed according to their relative values to the acre. In the making of the tables for 1918, 1919, and 1920 the length and grade of staple was considered along with the yield of lint and seed.

The cotton in the test was graded and stapled by specialists from the U. S. Bureau of Markets and Texas Agricultural and Mechanical College Extension Service (cooperating).

Table 1 gives ten of the better varieties in the variety test of cotton in 1917, with yields of lint and seed. Fifty-two varieties were in the test. Kasch, Lone Star, Improved Champion, Heavy Fruiter, and Mebane were the five highest-yielding varieties. Acala was not among the ten best varieties, but it is included because its performance in 1919 and 1920 places it among the varieties best adapted to our conditions.

Table 1.—Ten of the better varieties in 1917.

Variety Name.	Per cent Lint	Acre Yield, Pounds Lint	Acre Yield, Pounds Seed
Kasch	39.24	883.92	1368.69
Lone Star	37.67	845.91	1399.44
Improved Champion	37.56	840.77	1397.72
Vandiver's Heavy Fruiter	34.30	826.02	1582.09
Mebane	36.45	753.37	1313.21
Ferguson Roundnose	35.38	743.33	1357.66
Wannamaker Cleveland	38.23	728.59	1177.00
Mortgage Lifter	32.32	690.96	1446.72
King's Extra Early	33.13	647.06	1305.70
Acala	34.53	569.65	1080.08

Table 2 gives the acre yields of lint and seed, the percentage of lint, and length and grade of staple of the ten best varieties in 1918. Fifty varieties were included in the test. It will be noted that none of the staple cottons appear in this list. Mortgage Lifter, which made the highest yield of lint, has medium large bolls and a short staple. These

relatively low yields of lint, as compared to the yields of 1917 and 1919 and the fact that the longer-staple varieties do not appear among the highest-yielding varieties, perhaps may be due to the dry season.

Table 2.—Ten most profitable varieties in 1918. Arranged in order of net returns to the acre.

Variety Name	Per Cent Lint	Length of Staple, Inches	Grade of Staple	Acre Yield, Pounds Lint	Acre Yield, Pounds Seed
Mortgage Lifter	45.47	1	S M	438	526
Early King	39.06	7/8	G M	357	557
Simpkins Prolific	42.51	15/16	M	345	466
F. G. 33	40.17	1 1/16	G M	291	434
Vandiver's Heavy Fruiter	39.28	7/8	S M	327	506
Boykin	42.02	1	G M	291	402
Mebane	39.00	1	G M	283	442
Lone Star	37.05	1	G M	268	455
Cook	42.30	3/4	S M	374	511
King X Triumph	37.79	7/8	G M	280	460

The test included forty-four varieties in 1919.*

The ten most profitable varieties are listed in Table 3. Snowflake, a typical long-staple cotton, was the most profitable variety on the New Orleans market on account of its length of staple. Mebane (T. S. No. 804), however, was perhaps the most profitable variety as sold on the ordinary market. Arranged in order of lint yield, the five best varieties are Mebane (T. S. No. 804), Union Big Boll, Acala No. 5, Mebane (T. S. No. 3635), and Kasch.

Table 3.—Ten most profitable varieties in 1919. Arranged in order of net returns to the acre.

Variety Name	Per Cent Lint	Length of Staple, Inches	Grade of Lint	Acre Yield, Pounds Lint	Acre Yield, Pounds Seed
Snowflake	30.09	1 1/2	S M	366	851
Mebane (T. S. No. 804)	33.22	1	M	586	1178
Acala	36.30	1 1/16	S M	571	1008
Express	33.44	1 1/4	M	416	829
Mebane (T. S. No. 3635)	34.92	1	G M	468	872
Lone Star	34.39	1 1/8	G M	435	830
Jackson	34.71	1	G M	446	839
Kasch	37.77	1	S M	461	760
Union Big Boll	32.58	3/4	S M	577	1196
Chisholm	33.75	7/8	G M	434	852

Only ten varieties were included in the test in 1920, as shown in Table 4. Acala and Rowden are the best-yielding varieties, while Belton, Bennett, Mebane, and Lone Star rank well up in the list. This is the first year Rowden has been one of the leading varieties. With the exception of Acala, Rowden, and Belton, the length of staple is shorter than is typical of each variety.

*The grade and staple of all varieties of cotton grown at Substation No. 3, in 1919, are given in full in Bulletin 266, "The Staple of Texas Cotton," Texas Agricultural Experiment Station, 1920.

Table 4.—Cotton variety test in 1920. Varieties arranged in order of value to the acre.

Variety Name	Per Cent Lint	Length of Staple, Inches	Grade of Lint	Acre Yield, Pounds Lint	Acre Yield, Pounds Seed
Acala	35.55	1 1/8	G M	319	565
Rowden	34.95	1 1/16	G M	305	538
Belton	35.27	1 1/16	G M	295	513
Bennett	38.28	1 1/8	S M	292	430
Mebane	38.33	7/8	S M	319	506
Lone Star	36.68	1 full	S M	285	463
Kasch	40.52	7/8 full	G M	311	422
Lone Star	36.15	1 full	G M	251	415
Snowflake	29.50	1 1/4 full	G M	186	415
Durango	33.65	1 3/16	G M	189	353

We have discussed the best varieties in individual years in Tables 1, 2, 3, and 4. Now if the highest-yielding varieties which have appeared every year of the test are selected, four varieties stand out prominently. These four varieties with their yields are grouped together in Table 5 for direct comparison.

SUMMARY OF RESULTS.

Table 5. Varieties of cotton adapted to conditions in the Central Gulf Coastal Plains of Texas.

Variety Name	Acre Yield, Pounds Lint					Acre Yield, Pounds Seed				
	1917	1918	1919	1920	Average*	1917	1918	1919	1920	Average*
Mebane	753	283	586	319	485	1313	442	1178	506	860
Kasch	883	191	461	311	462	1368	268	760	422	705
Lone Star	845	268	435	285	458	1399	455	830	463	787
Acala	569	176	571	319	409	1080	338	1003	565	746
Snowflake	415	250	366	186	304	798	550	851	415	654

*Note.—The average yields of lint and seed were calculated from yields with decimals. The decimals are omitted here.

Mebane has made the highest average yield to the acre. Furthermore, it has been the most profitable variety. Kasch, Lone Star, and Acala, named in order of yield, are the other three varieties well adapted to the conditions in this part of Texas. Lone Star on account of its staple has been slightly more profitable than Kasch.

Snowflake has been the best-yielding and most profitable variety of long-staple cotton grown at Substation No. 3.

The varieties in Table 5 may be placed into different groups with respect to size of boll. Mebane, Lone Star, and Kasch have large bolls, while Acala and Snowflake have smaller bolls. As an average of the four years, the following number of well-opened bolls were required to make a pound of seed cotton of the different varieties: Mebane, 62; Kasch, 60; Lone Star, 59; Acala, 70, and Snowflake, 78 bolls.

APPENDIX

The following varieties of cotton have been included in the variety tests of cotton at Substation No. 3, Angleton, Texas. The varieties which were not mentioned in the preceding pages were not considered to be worthy of further trial and were discontinued in 1920, as shown by the varieties which were included in the test in 1920.

List of varieties in variety test of cotton in 1917.

T. S. No.	Variety Name	T. S. No.	Variety Name
2461	Acala	2493	King
2484	Allen's Express	2476	King-Triumph
2481	Bank Account	2472	Lone Star
2471	Boykin	2494	Lone Star
2499	Broadwell's Double Jointed	2482	Matchless Extra Early
2456	Chisholm	2459	Mebane
2475	Cleveland	2470	Mebane
2486	Cleveland	2491	Mebane
2581	Columbia Long Staple	2500	Mexican Big Boll
2477	Cook	2498	Money Maker
2466	Cook's Silk Long Staple	2479	Mortgage Lifter
2501	Durango	2505	Peterkin
2488	Early King	2458	Rowden
2502	Express	2490	Rowden
2464	F. G. 33	2489	Simpkin's Ideal
2469	Ferguson Round Nose	2487	Simpkin's Prolific
2504	Half and Half	2467	Snowflake
2460	Harvell	2478	Sure Crop
2480	Hastings' Upright	2468	Texas Progress
2485	Hawkins	2497	Toole
1040	Heavy Fruiter	2503	Trice
2496	Hite's Prolific	2483	Union Big Boll
2473	Holdon	2463	Vandiver's Heavy Fruiter
2462	Improved Champion	2495	Wannamaker
2492	Jackson	2474	Wannamaker-Cleveland
2465	Kasch	2457	Webb

List of varieties in variety test of cotton in 1918.

T. S. No.	Variety Name	T. S. No.	Variety Name
3025	Acala	3036	Lone Star
3045	Allen's Express	2997	Matchless Extra Early
3022	Bank Account	804	Mebane
3038	Boykin	3002	Mebane
3078	Broadwell's Double Jointed	3006	Mebane
3001	Chisholm	3039	Mebane
3044	Cleveland	3035	Mebane
3028	Cook	3037	Mebane
3030	Cook	3040	Mebane
3026	Cook's Silk Long Staple	3065	Mexican Big Boll
3061	Durango	3077	Money Maker
3062	Express	3021	Mortgage Lifter
3000	F. G. 33	3003	Rowden
3034	Ferguson Round Nose	3057	Rowden
3066	Half and Half	3033	Simpkin's Ideal
2996	Hastings' Upright	3047	Simpkin's Prolific
2998	Heavy Fruiter	2990	Snowflake
3079	Hite's Prolific	3020	Sure Crop
2991	Holdon	2994	Texas Progress
3056	Improved Champion	3064	Toole
3048	Kasch	3063	Trice
3046	King	2995	Union Big Boll
2989	King	3023	Wannamaker
3029	King-Triumph	3027	Wannamaker
3005	Lone Star	3004	Webb

List of varieties in the variety test of cotton in 1919.

T. S. No.	Variety Name	T. S. No.	Variety Name
3656	Acala	3150	Lone Star
3657	Acala	3642	Lone Star
3658	Acala	3643	Lone Star
3659	Acala	3644	Lone Star
793	Belton	3645	Lone Star
3653	Belton	3646	Lone Star
3640	Bennett	3648	Lone Star
3638	Boykin	804	Mebane
3665	Buckelew Big Boll	3632	Mebane
3661	Chisholm	3633	Mebane
3673	Cleveland	3634	Mebane
3666	Durango	3635	Mebane
3667	Express	3676	Mebane
3655	Ferguson Round Nose	3677	Mebane
3668	Foster	3650	Rowden
3664	Gilstrap	3651	Rowden
3675	Half and Half	3670	Snowflake
3662	Harvell	3636	Triumph (406)
3649	Holdon	3660	Truitt
3647	Jackson	3674	Union Big Boll
3637	Kasch	3639	Webb
3669	Kekchi	3654	Willis

List of varieties in the variety test of cotton in 1920.

T. S. No.	Variety Name	T. S. No.	Variety Name
4131	Acala	3150	Lone Star
793	Belton	4119	Lone Star
4115	Bennett	4120	Mebane
4114	Durango	4116	Rowden
4117	Kasch	4118	Snowflake

RAINFALL DATA

The rainfall at Angleton, Texas, by months, 1914-1920, inclusive, is given in Table 6.

Table 6.—Rainfall at Substation No. 3, Angleton, Texas, 1914–1920, inclusive.

Month.	1914	1915	1916	1917	1918	1919	1920	Average
January	0.49	2.96	1.62	2.34	0.27	6.20	6.02	2.842
February	3.16	4.03	0.13	2.98	0.85	2.59	1.85	2.227
March	2.93	3.53	0.42	0.75	2.30	9.21	1.36	2.928
April	13.46	2.25	1.64	2.37	5.65	1.35	0.54	3.894
May	7.89	2.66	6.59	6.04	1.68	5.27	3.64	4.824
June	0.26	0.00	5.37	0.44	1.41	16.57	5.83	4.268
July	1.73	3.95	5.66	3.12	2.48	6.55	4.76	4.035
August	8.49	13.87	5.43	1.66	3.51	5.42	9.10	6.782
September	4.34	6.29	3.55	1.15	2.87	3.62	2.49	3.472
October	3.61	2.49	1.08	0.49	5.67	5.93	6.81	3.725
November	8.02	2.04	1.68	0.84	6.91	2.30	3.83	3.660
December	4.19	4.74	2.13	0.56	3.93	1.78	3.05	2.911
Total	58.57	48.81	35.30	22.74	37.53	66.79	49.28	45.57

The data show that the active growing season of cotton in 1917 was comparatively dry,—a condition which favored high yields of cotton. In 1919 and 1920, June, July, and August had relatively heavy precipitation. The rains in August, 1920, seriously reduced the yield and quality of cotton.